

Abstract of the Disclosure

PREPARATION AND USE OF A NANOCOMPOSITE OF ELASTOMER AND EXFOLIATED CLAY PLATELETS FORMED IN SITU WITHIN AN ELASTOMER HOST AND ARTICLES OF MANUFACTURE, INCLUDING TIRES, HAVING AT LEAST ONE COMPONENT COMPRISED THEREOF

This invention relates to preparation and use of nanocomposites comprised of an elastomer matrix which contains a dispersion therein of at least partially exfoliated platelets of an intercalated, multilayered, water swellable clay (e.g. montmorillonite clay). The exfoliated platelets are derived from such intercalated clay formed by an in situ cation exchange phenomenon between cationically exchangeable ions within the galleries between the layers of the multilayered clay with a pre-formed latex of cationic (positively charged) elastomer particles. Said positively charged latex elastomer particles may be prepared by free radical emulsion polymerization using:

- (A) a non-polymerizable cationic surfactant, and/or
- (B) a polymerizable cationic surfactant.

Optionally, an additional cationic charge may be incorporated onto the cationic elastomer latex particles through the use and in the presence of:

- (C) a polymerizable comonomer bearing a cationic charge,
- (D) a free radical generating polymerization initiator bearing a cationic charge, and/or
- (E) a free radical chain transfer agent bearing a cationic charge.

Such free radical induced emulsion polymerizations are exclusive of a thermoplastic polymer latex and are exclusive of the presence of an anionic surfactant. Rubber composites can be prepared by blending such nanocomposite with additional elastomer(s), additional reinforcing filler(s) and/or a coupling agent. The invention further relates to the preparation of articles of manufacture, including tires, having at least one component comprised of said nanocomposite or said rubber composite. Such a tire component may be selected from, for example, tire tread and tire innerliner.